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THROUGH SCIENCE

Versatile Test Reactor

December 9, 2020

Note: Information regarding site location is **preliminary**. The decision for site location is determined via DOE acquisition processes that have not yet been completed.

About the Versatile Test Reactor

VTR
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- 2018 – Department of Energy establishes VTR program after several studies highlight need.
- 6 national labs, 19 universities, and 10 industry partners
- DOE 413.3B – Process for development of major systems projects.

Did you know?

The VTR project is led by Idaho National Laboratory on behalf of DOE's Office of Nuclear Energy.

What is VTR?

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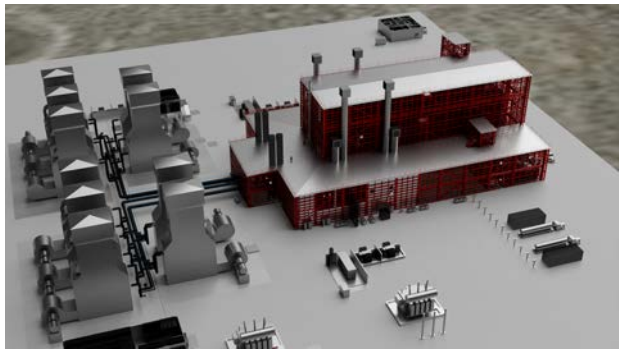
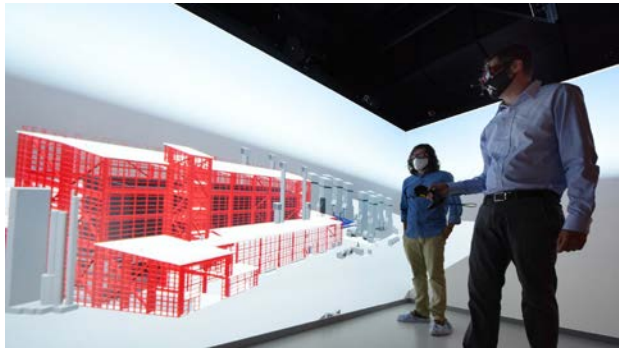
- A test reactor for the development of advanced materials, fuels, instrumentations and sensors.
- Conceptual design is a sodium-cooled pool type reactor with power of 300 MWth; larger improved version of EBR-II.
- Strictly used for research and development.
- Will generate high energy neutrons at higher concentrations (neutron flux) to support a different class of reactor designs under development.
- Advanced Test Reactor produces moderated (low-energy) neutrons to support testing needs for the Navy and current nuclear technology.





VTR Milestones

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1st Major Milestone

Critical Decision 0 achieved in 2019:

- Commercial developers of advanced nuclear energy technologies
- National security interests
- Scientific community

2nd Major Milestone

Critical Decision 1 achieved Sept 2020:

- Analysis of alternatives
- Conceptual design and conceptual safety design
- Cost and schedule ranges

3rd Major Milestone

Critical Decision 2/3 projected 2022/2024:

- Supplier qualification
- Final design
- Preliminary documented safety analysis
- Long lead procurements

4th Major Milestone

Critical Decision 4 projected 2026-2030:

- Operations training complete
- Key Performance Parameters verified
- Final documented safety analysis
- ORR Complete
- Permission to load fuel received

VTR Supplier Engagement

- Engineering, Procurement, and Construction (EPC) blanket master contract currently being negotiated. Team is by Bechtel National (main subs include GEH and TerraPower).
- Procurement of goods and services for design and construction of the VTR would be through the EPC contractor.
- A web site link will be available once Preliminary Design begins (projected to be December 2021) to “get your name on the list.”
- Procurements range from commercial grade to fully compliant NQA-1 equipment such as N stamped vessels.
- Bias toward awarding work to small businesses.
- During construction, anticipate a local need for welders, concrete supplier and finishers, pipe fitters, iron workers, construction laborers, etc.
- During operations anticipate a local need for reactor operators, mechanics, I&C technicians, engineers, etc.
- Supply chain and local work force development is needed to make VTR successful.
- Looking to the marketplace for creative ways to provide the goods and services needed to make the VTR a reality.

VTR: National Environmental Policy Act

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Notice of Intent published in the Federal Register

DOE hosts public scoping meetings via webinar

Draft Environmental Impact Statement (EIS) undergoing DOE review

EIS will look at:

- No Action Alternative, Build VTR at INL and Build VTR at Oak Ridge National Lab
- Will also look at fuel fabrication at INL and Savannah River Site

Draft EIS will be published and public review begins Public Review of Draft EIS

- At least 45-day comment period
- At least one public (via Webinar) meeting required with 15 days advanced notice

DOE releases final EIS

- Respond to oral and written comments on the Draft EIS
- 30 day waiting period (after EPA Notice of Availability is published)

DOE issues record of decision

- Reactor site
- Fuel fabrication site

Summary & Conclusions

- When operational, VTR will be the world's premier fast spectrum test reactor allowing technology developers and scientists access to state-of-the-art capabilities.
- VTR will provide the missing piece of research and development infrastructure and help will re-establish U.S. as the global leader in nuclear energy innovation.
- Even in early design phase, VTR is making an impact on nuclear energy innovation.
- Registration for local suppliers available approximately one year from today through a BNI web page.
- VTR will be authorized and operated under the DOE authority, working closely with the Nuclear Regulatory Commission (NRC).

Questions?

For more information, visit www.inl.gov/vtr

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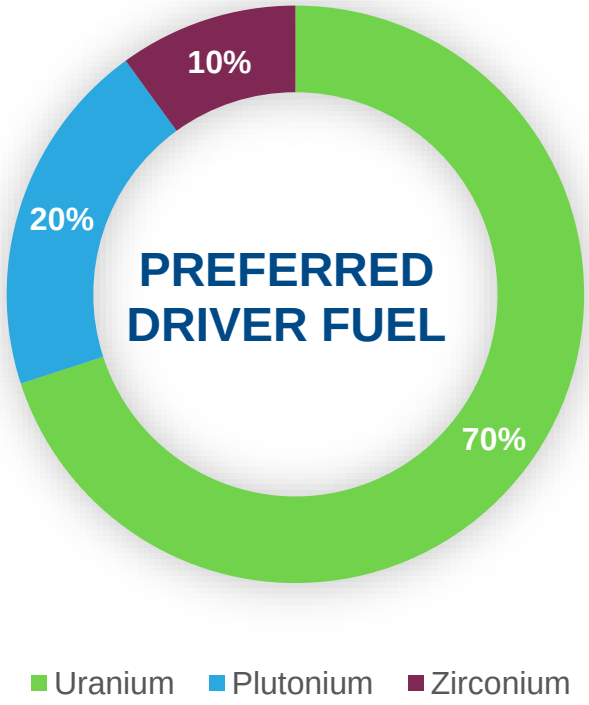
inl.gov/vtr | 208-526-1151 | email@inl.gov

VTR: Nuclear Materials Management

- Preferred driver fuel is a metallic fuel alloy (similar to EBR-II fuel).
- MOU signed between DOE Office of Nuclear Energy and Nuclear National Security Administration to source plutonium and transfer material to fuel fabrication site.
- ~4000 pounds of heavy metal needed per year for fuel fabrication.
  - 880 pounds will be plutonium (could be closer to 1,100 pounds in early phases).



National VTR: Potential Job Opportunities

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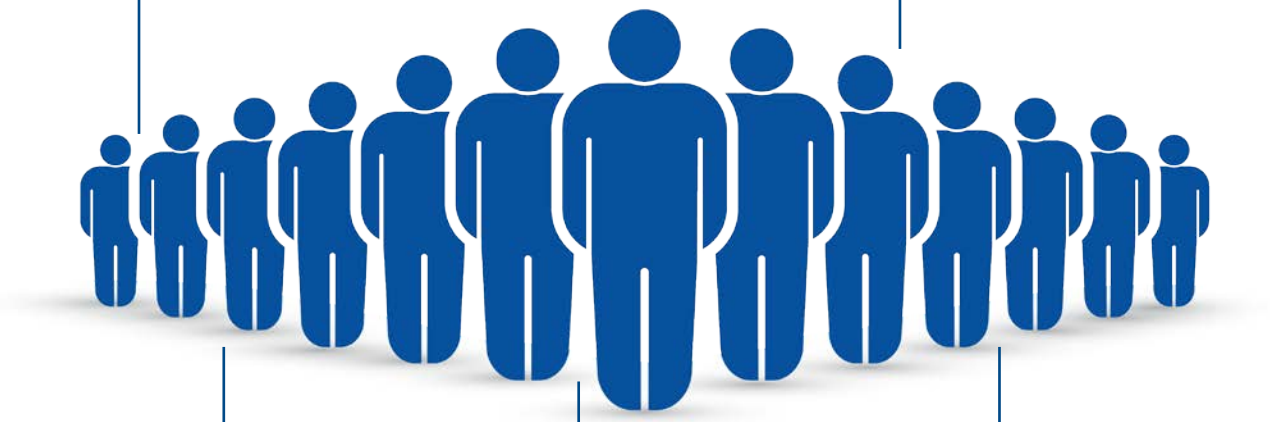
500 engineering support and fuel fabrication labor during construction

~300 jobs for material and service suppliers



250-750 additional jobs during design

225-300 jobs once reactor is operating

1,300 construction workers needed to build VTR

VTR is a one-of-a-kind scientific research facility that will draw scientists and technology developers from around the country world. This along with VTR related workshops, conferences, seminars, etc., will considerably boost local economy in community in which the reactor is located.